

GEOLOGY**CLASS-XI
THEORY****One Paper****3 Hours****70 Marks**

Unit	Unitwise Weightage	Marks	Periods
I.	General Geology and Physical Geology	15	40
II.	Crystallography and Mineralogy	20	50
III.	Palaeontology	20	50
IV.	Economic Geology	15	40

Unit I : General Geology and Physical Geology 40 Periods : 15 Marks

- (i) Introduction of Geology, definition, scope of Geology and branches of Geology.
- (ii) The Earth as Planet, shape, of the Planet.
- (iii) Origin of the Earth–Nabular hypothesis. Planetesimal hypothesis. Double star hypothesis and Recent hypothesis.
- (iv) Age of the earth–Concept of determination of the age of the earth by Radioactive method.
- (v) Internal constitution and structure of the earth as revealed by Seismic waves.
- (vi) Earthquake-definition, causes, effects and types.
- (vii) Volcanoes–definition, causes, structure and products.
- (viii) Concept of Plate tectonics.
- (ix) Definition, agents and processes of weathering, erosion, denudation and deposition.

Unit II : Crystallography and Mineralogy : 50 Periods : 20 Marks

- (i) Crystal-definition, form, face, edge, solid angle, interfacial angle and its measurements, Symmetry elements, intercepts and parameters, indices and axial ratio.
- (ii) Crystal systems-Classification of seven crystal systems, -Study of the Normal Classes of Isometric system, Tetragonal system, Hexagonal system with examples.
- (iii) Mineral - definition, types of minerals (amorphous, Crystalline, rock forming minerals, ore forming minerals)
- (iv) Physical properties of minerals-form, Colour, streak, lustre, cleavage, fracture, hardness, tenacity, taste, feel, odour etc.

- (v) Nicol Prism and its construction, Part of Petrological microscope.
- (vi) Moh's scale of Hardness and its uses.
- (vii) Study of Physical properties, Chemical composition and uses of the following rock forming minerals-Quartz, Orthoclase, Microcline, Plagioclase, Calcite, Homblende, Olivine, Tourmaline, Muscovite, Biotite, Talc, Gypsum, Garner, Flourite, Apatite, Corundum.

Unit III : Palaeontology : 50 Periods : 20 Marks

- (i) Definition and branches of palaeontology
- (ii) Definition-fossil, index fossil, Megafossil, Macrofossils, Microfossils.
- (iii) Conditions for fossilisation, mode of preservation and uses of fossils
- (iv) Classification, Morphological study, time range and distribution of Lamellibranchia, Brachiopoda and Gastropoda.

Unit IV : Economic Geology 40 Periods : 15 Marks

- (i) Definition - Ore, Gangue, tenor
- (ii) Classification of mineral deposits.
- (iii) Formation of mineral deposits-Magnetic and oxidation processes.
- (iv) Study of - Origin, mode of occurrence, Geographical distribution and uses of the following ore minerals-Galena, Gold, Heamatite, Megnetite, Chromite, Chalcopyrite, Pyrite, Coal, Petroleum, Bauxite.
- (v) Mineral resources of Manipur.

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GEOLOGY

CLASS-XI PRACTICAL

One Paper **3 Hours** **30 Marks**

Unit	Unitwise Weightage	Marks
I.	Crystallography	06 marks
II.	Mineral Hand Specimens	08 marks
III.	Mineral Slides	04 marks
IV.	Fossils	06 marks
V.	Practical Note Book	04 marks
VI.	Viva-Voce	02 marks

Experiments :

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|--------|--|---------|
| (i) | Study of crystal belonging to the Normal Classes of Isometric, Tetragonal, Hexagonal Systems | 4 marks |
| (ii) | Measurements of Interfacial angles on crystal models with the help of contact Goniometer. | 2 marks |
| (iii) | Determination of specific gravity of minerals with the help of Jolly's spring balance, walker's steelyard balance or Chemical balance. | 2 marks |
| (iv) | Recognition of mineral hand specimens by physical characters and simple chemical tests of the following miners - Quartz, Orthoclase, Microcline, Plagioclase, Muscovite, Biotite, tourmaline, Calcite, Hornblende, talc, Gypsum, Beryl, Olivine, Garnet, Chromite, Magnetite, Hematite, Bauxite Pyrite, Galena, Chalcopyrite, Apatite, Corundum. | 6 marks |
| (v) | Recognition of the following rock forming mineral thin slides under polarising microscope-Garnet, Quartz, Orthoclase, Microcline, Augite, Hornblende, Biotite, Muscovite and Plagioclase. | 4 marks |
| (vi) | Study of the morphological characters, time range of the following fossils - Arca, Spirifer, Productus Terebratula, Atrypa, Unio, Pecten, Cardita, Conus Voluta, Turritella, Mytilus, Physa. | 6 marks |
| (vii) | Practical Note Book. | 4 |
| (viii) | Viva-Voce. | 2 |

DESIGN QUESTION PAPER/UNIT TEST

Subject : GEOLOGY
Unit/Paper : Theory
Class : XI
Time : 3 Hours
Full Marks : 70

I	WEIGHTAGE TO OBJECTIVES :					
	Objectives	K	U	A	S	Total
	Percentage of Marks	35	45	15	05	100
	Marks	25	31	10	04	70
II	WEIGHTAGE TO FORM OF QUESTIONS :					
	Forms of Questions	E	SA-I	SA-II	VSA	O
	No. of Questions	03	07	10	10	04
	Marks Allotted	15	21	20	10	04
	Estimated Time (in Minutes)	60	42	40	30	08
III	WEIGHTAGE TO CONTENT:					
	Units/Sub-units					Marks
	1.	General Geology and Physical Geology				15
	2.	Crystallography and Mineralogy				20
	3.	Palaeontology				20
	4.	Economic Geology				15
Total :					70	
IV.	SCHEME OF SECTION : Nil					
V.	SCHEME OF OPTIONS : Nil					
VI.	DIFFICULTY LEVEL:					
	Difficult : 15% marks					
	Average : 50% marks					
Easy : 35% marks						

Abbreviation : K (Knowledge), U (Understanding), A (Application),
S (Skill), E (Essay Type), SA (Short Answer Type),
VSA (Very Short Answer Type), O (Objective Type)

- (iv) Sedimentary rocks-Environment of deposition, Classification of Sedimentary rocks into Clastic and Non-clastics, Structure and texture of Sedimentary rocks.
- (v) Metamorphic rock-agents and types of Metamorphism, study of simple structure and texture of Metamorphic rocks.
- (vi) Study of mineralogical, structural feature and mode of occurrence of the following rock types-Granite, Dolerite, Diorite, Gabbro, Dunite, Peridotite, Pegmatite, Rhyolite, Basalt, Slate, Schist Gneiss, Marble Quartzite, Sandstone, Limestone, Shale, Conglomerate.

Unit IV : Applied Geology

40 Periods : 15 Marks

- (i) Elementary knowledge of - Mineral deposits, mineral exploration and prospecting
- (ii) Soil erosion - causes and its prevention.
- (iii) Landslide - causes and its prevention.
- (iv) Geology of underground water.
- (v) Selection of construction materials.
- (vi) Site selection of dam construction.

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GEOLOGY

CLASS-XII

PRACTICAL

One Paper**3 Hours****30 Marks**

Unit	Unitwise Weightage	Marks
I.	Geological Maps	10 marks
II.	Rock hand specimens	08 marks
III.	Geographical distribution of Stratigraphic System	02 marks
IV.	Geological field report	04 marks
V.	Practical Note Book	04 marks
VI.	Viva-Voce	02 marks

Experiments :

- (i) Determination of strike direction, dip direction and amount of dip of an incline surface with the help of clinometer compass. 02 marks
- (ii) Description of geological map and drawing of profile. 08 marks
- (iii) Recognition of rock hand specimens of the following-Granite, Gabbro, Dolerite, Dunite, Peridotite, Pegmatite, Rhyolite, Basalt, Slate, Schist, Marble, Quartzite, Sandstone, Limestone, Shale, Conglomerate. 08 marks
- (iv) Geographical distribution of the following stratigraphic systems-Dharwar system; Vindhyan system of some valley, Gondwana system, Tertiaries of N.E. India. 02 marks
- (v) Geological Field Report-Field work is compulsory and reports of the field work are to be submitted at the time of examination. 4 marks
No student can appear practical examination without submission of field report.
- (vi) Practical Note Book. 04
- (vii) Viva-Voce. 02

Prescribed Textbook for Classes XI & XII :

1. Text Book of Geology - P.K. Mukherjee
(The world Press Pvt. Ltd. Calcutta)
2. Text Book of Geology - G.B. Mahapatra
(C.B.S. Publisher and Distributor, New Delhi)
3. Laboratory Manual of Geology - A.K. Sen
(Modern Book Agency Pvt. Ltd. Calcutta)

Reference Books for Classes XI & XII :

1. Physical Geology - Dutta A.K.
(Modern Book Agencies Pvt. Ltd. Calcutta)
2. Economic Geology - Sen and Guha
(Modern Book Agencies Pvt. Ltd. Calcutta)
3. Principles of petrology - Tyrrel G.W.
(B.I. Publication Pvt. Ltd. New Delhi)
4. Text Book of Palaeontology-Woods
(C.B.S. Publisher and Distributor, Delhi)
5. Rutley's Elements of Mineralogy-Read N.H.
(C.B.S. Publisher and Distributor, Delhi)
6. Structural Geology - M.P. Billings
(Prentice Hall of India Ltd. New Delhi)

DESIGN
QUESTION PAPER/UNIT TEST

Subject : GEOLOGY
Unit/Paper : Theory
Class : XII
Time : 3 Hours
Full Marks : 70

I	WEIGHTAGE TO OBJECTIVES :						
	Objectives	K	U	A	S	Total	
	Percentage of Marks	35	45	15	05	100	
	Marks	25	31	10	04	70	
II	WEIGHTAGE TO FORM OF QUESTIONS :						
	Forms of Questions	E	SA-I	SA-II	VSA	O	Total
	No. of Questions	03	07	10	10	04	34
	Marks Allotted	15	21	20	10	04	70
	Estimated Time (in Minutes)	60	42	40	30	08	180
III	WEIGHTAGE TO CONTENT:						
	Units/Sub-units					Marks	
	1.	Structural Geology				15	
	2.	General Stratigraphy and Indian Stratigraphy				20	
	3.	Petrology				20	
	4.	Applied Geology				15	
Total :					70		
IV.	SCHEME OF SECTION : Nil						
V.	SCHEME OF OPTIONS: Nil						
VI.	DIFFICULTY LEVEL:						
	Difficult : 15% marks						
	Average : 50% marks						
	Easy : 35% marks						

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S (Skill), E (Essay Type), SA (Short Answer Type),
VSA (Very Short Answer Type), O (Objective Type)

DESIGN
QUESTION PAPER/UNIT TEST

Subject : GEOLOGY

Unit/Paper : Practical

Class : XII

Time : 3 Hours

Full Marks : 30

I	WEIGHTAGE TO OBJECTIVES :						
	Objectives	K	U	A	S	Total	
	Percentage of Marks	13	20	27	40	100	
	Marks	04	06	08	12	30	
II	WEIGHTAGE TO FORM OF QUESTIONS :						
	Forms of Questions	E	SA-I	SA-II	VSA	O	Total
	No. of Questions	03	06	04	02	-	15
	Marks Allotted	12	12	04	02	-	30
	Estimated Time (in Minutes)	60	90	20	10	-	180
III.	WEIGHTAGE TO CONTENT:						
	Units/Sub-units					Marks	
	1.	Determination of dip and strike				2	
	2.	Geological mapping				8	
	3.	Identification of rock and specimens				8	
	4.	Stratigraphical distribution of systems				2	
	5.	Geological field report				4	
	6.	Practical Note book				4	
	7.	Viva Voce				2	
Total :					30		
IV.	SCHEME OF SECTION : Nil						
V.	SCHEME OF OPTIONS: Nil						
VI.	DIFFICULTY LEVEL:						
	Difficult : 15% marks						
	Average : 50% marks						
	Easy : 35% marks						

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S (Skill), E (Essay Type), SA (Short Answer Type),
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